

Meeting Notes: Retrieval Completion Certification per the Consent Decree

Meeting Date: January 9, 2012, 12:00 pm

Location: 2440 Stevens Center, room 2200

Purpose: Continue discussion of the Consent Decree requirement for a written certification that DOE has completed retrieval of a tank.

Attendees: Jeff Lyon, Ecology, Nancy Uziemblo, Ecology, Bob Lober, ORP, Steve Killoy, WRPS, Mike Peloquin, WRPS, Mike Connelly, WRPS, Jeff Luke, WRPS, Susan Eberlein, WRPS

Background:

Consent Decree 08-5085-FVS (State of Washington v. Steven Chu, US Department of Energy) section IV.B.5, requires that "When DOE completes retrieval of waste from a tank covered by this Decree, DOE will submit to Ecology a written certification that DOE has completed retrieval of that tank." (page 7) The details of this written certification have not previously been defined.

Topics discussed:

- The timing of post-retrieval sampling was discussed. It is the understanding of the participants that a post-retrieval sample is not required to provide the CD retrieval completion certification. The post-retrieval sample is required for the retrieval data report.
- Mike Peloquin presented an outline of topics that could be covered in the CD retrieval completion certification, based on the inputs and discussions in our previous meetings (Attachment A). Suggestions changes to the outline included:
 - Provide a brief summary of the basis for selecting retrieval technologies (from the Tank Waste Retrieval Work Plan, TWRWP), and reference the TWRWP.
 - Include information similar to the graphs in the C-104 presentation hand out (Attachment B) to describe implementation of the retrieval technology, and make a case that "all reasonable efforts" to retrieve had been made.
 - Include references to logbooks and other data sources that provide the basis for saying "all reasonable efforts" have been made.
 - Consider including the Limit of Technology (LOT) discussion in the same section where each technology is described.
- Mike Peloquin took an action to get more information on how daily retrieval operations are documented, particularly in regard to demonstrating "all reasonable efforts".
- Definitions of LOT for technologies other than modified sluicing were discussed.
 - These definitions are expected to be case-specific until more data is obtained on each technology.
 - There are some parameters that we would reasonably expect to measure regardless of the technology, such as duration of retrieval operation, and amount of waste removed.

- Mike Peloquin took an action to update the outline (Attachment A) to include topics discussed above.
- The process for submitting the CD retrieval completion certification was discussed.
 - Ecology would like to review a draft before each one is submitted.
 - If changes to the draft are identified that would make the case stronger, it was agreed that those changes should be pursued if possible (i.e. if the requested information is available).
 - Once a submittal is made, Ecology can do nothing (which implies approval) or dispute the submittal.
- There should be a process for identifying and incorporating improvements to future CD retrieval completion certification submittals.
 - We recognize that the current outline is establishing an initial and potentially evolving document.
 - A good faith effort should continue to be made to discuss the content and update the outline as more experience is gained.
- There was further discussion of how to ensure that the right parameters are being measured during retrieval if the LOT criteria have not been established for a technology. There will need to be discussion in advance of what parameters are being measured.
- Once we have developed an outline of the CD retrieval completion certification, there may be merit in trying to populate the outline with some information from C-108 to determine if we have overlooked anything important.
- Jeff Luke took the action to draft a "statement of certification" of retrieval completion for the CD.
- If a CD retrieval completion certification includes a request to forego a third technology, that request must be approved by Ecology before the CD retrieval completion certification is submitted.
- The discussion moved on to the evaluation of practicality or practicability (terms used interchangeably for these meeting notes), required for a request to forego a third technology.
- The practicality evaluation should not address only one possible third technology if several technologies are available.
- The practicality evaluation should consider all available technologies.
- Some advance planning should be performed so that lead time to obtain an available piece of equipment is not the sole reason that deployment is not practicable.
- Inventory reduction was discussed as the parameter to consider for "risk reduction" in this context.
- It may be possible to make an argument that the third technology provides very little inventory reduction, and that greater inventory reduction can be achieved by taking other action. However, such arguments need to carefully consider the big picture of all the actions that need to be taken in the farm or area.
- Inventory reduction arguments may also lead to suggesting that a second technology should not be deployed in some situations.
 - This is currently out of scope of the consent decree (which requires a second technology).
 - There is benefit in continuing to deploy second technologies in the near term, to gain more experience on their effectiveness.
 - At some future point, discussion of a change to the consent decree may be in order.

- The consent decree language does not currently require a practicality evaluation to address the LOT.
- It may be advisable to consider inventory reduction as part of the LOT definition for future technologies. For example, rather than measuring only the specific gravity of liquids removed from the tank, also measure radioactivity. If a retrieval technology is removing only inert material, the LOT may have been met.
- It was noted that use of inventory reduction as a surrogate for risk reduction would need to be discussed with our various management to make sure all parties agree with the approach.
- The next meeting was tentatively set for Thursday January 19.

Actions:

- Set next meeting for January 19, 2012. (Peloquin)
- Get more information on how daily retrieval operations are documented, particularly in regard to demonstrating "all reasonable efforts". (Peloquin)
- Update the outline (Attachment A) to include topics discussed above. (Peloquin)
- Draft a "statement of certification" of retrieval completion for the CD. (Luke)

Concurrence:

CKJ 1-30-12
Chris Kemp, ORP Date

[Signature] 1-26-2012
Jeff Lyon, Ecology Date

Attachment A: DRAFT FOR DISCUSSION
CONSENT DECREE RETRIEVAL COMPLETION CERTIFICATION

INTRODUCTION

Consent Decree 08-5085-FVS (State of Washington v. Steven Chu, US Department of Energy) section IV.B.5 requirement: "When DOE completes retrieval of waste from a tank covered by this Decree, DOE will submit to Ecology a written certification that DOE has completed retrieval of that tank. For purposes of this Consent Decree, "complete retrieval" means the retrieval of tank waste in accordance with Part 1 of Appendix C and with the retrieval technology/systems that were established by Part 1 of the TWRWP either by approval of Ecology or after dispute resolution by the Court under Section IX of the Decree."

LIST OF TECHNOLOGIES APPROVED IN PART 1 OF THE TANK WASTE
RETRIEVAL WORK PLAN

SYSTEM DESCRIPTION

Pre-Retrieval Condition

- Initial waste volume
- General conditions

Process Descriptions

First Technology

- Process description
- Equipment configuration
- Diagrams
- Waste Removal Methodology

- Note: This section would discuss how the technology was used to remove waste from all quadrants of the tank

Campaign Chronology

- Operational periods
 - General description of activities

Second Technology

- Process description
- Equipment configuration
- Diagrams
- Waste Removal Methodology

- Note: This section would discuss how the technology was used to remove waste from all quadrants of the tank

Campaign Chronology

- Operational periods
 - General description of activities

DRAFT FOR DISCUSSION

Third Technology, as applicable

COMPLETION OF WASTE RETRIEVAL USING TECHNOLOGIES TO THE LIMIT OF TECHNOLOGY (LOT)

First LOT Discussion

Performance graphic

Second LOT Discussion, if applicable

Third LOT Discussion, if applicable

Note: If LOT has not been approved, submit a case specific LOT

VOLUME OF RESIDUAL WASTE

Summary of Methodology for Estimating Residual Waste

Estimate of Waste Removed

Volume of Residual Waste Remaining, including uncertainty factor (confidence limit)

PRATICABILITY EVALUATION TO FOREGO THIRD TECHNOLOGY, if applicable

Executive Summary, Attach Document as Appendix A

ADDITIONAL INFORMATION – as applicable

Photos

CERTIFICATION

Statement of certification

REFERENCES

APPENDIX A Practicability Evaluation, if applicable

Attachment B: *DRAFT FOR DISCUSSION*

PRACTICALITY EVALUATION

(under the Consent Decree)

“Limits of technology” means that the recovery rate of that retrieval technology for that tank is, or has become, limited to such an extent that it extends the retrieval duration to the point at which continued operation of the retrieval technology is not practicable, with the consideration of practicability to include matters such as risk reduction, facilitating tank closures, costs, the potential for exacerbating leaks, worker safety, and the overall impact on the tank waste retrieval and treatment mission.”

EXECUTIVE SUMMARY

INTRODUCTION

SUMMARY OF AVAILABLE DATA AND INFORMATION

COMPLETION OF WASTE RETRIEVAL USING TECHNOLOGIES TO THE LIMIT OF TECHNOLOGY

- First Technology Discussion

- Includes Performance Graphic

- Second Technology Discussion

VOLUME AND CHARACTERISTICS OF RESIDUAL WASTE

- a. Volume of Residual Waste Remaining
- b. Characteristics of Residual Waste Remaining
 - 1. BBI Inventory
 - 2. Description for the basis of the inventory

EVALUATION OF 3rd TECHNOLOGY FOR WASTE RETRIEVAL

- Process Description

- Performance Assumptions

- Estimated Inventory Reduction

- Table of key constituent inventories and est. inventory reduction of third technology

EVALUATION OF THE OVERALL IMPACT ON TANK WASTE RETRIEVALS

Note: Recommend a minimum of three of the following areas of evaluation with emphasis on inventory reduction, worker safety and mission impact.

- a. Inventory Reduction Evaluation
 - 1. Current estimated inventory
 - 2. Evaluation based on the difference between 360 cubic feet and the actual remaining
 - 3. Compare current inventory to possible reduction of 3rd technology deployment
 - 4. Compare inventory vs. inventory in soil

5. Compare Ci/worker exposure vs Ci/worker exposure benefit of other tank deployment
 6. Ci/time vs Ci/time benefit of other tank
 7. Ci/technology vs Ci/technology benefit in other tanks
 8. Ci/\$ vs Ci/\$ benefit in other tanks
- b. Evaluation of Impacts to Worker Safety from 3rd Technology —This criterion includes as low as reasonably achievable (ALARA) considerations for both industrial (e.g., structural, chemical, electrical) and radiological safety and health.
 - c. Evaluation of Mission Impact from deploying 3rd Technology — This criterion assesses the potential for the alternative to impact WTP, impact overall schedule and impact continuing retrieval of other tanks or other mission priorities.
 1. Schedule Impacts To Other Tank Retrievals From Deploying Third Technology
 2. Impacts To Achieving Consent Decree Milestones
 3. Impacts to WTP
 4. Impacts to Mission
 - d. Evaluation of Potential for Exacerbating Leaks – All liquids have been removed from the tank and remaining solids will be immobilized
 - e. Schedule for the 3rd Technology —Total duration for installing, operating, and demobilizing of the particular technology and includes the confidence for achieving the scheduled end date.
 - f. Cost Evaluation of Deploying Third Technology —Total cost for installing, operating, and demobilizing the particular technology and includes confidence for completing within the indicated estimate
 - g. Ease of Implementation for the 3rd Technology —This criterion refers to the level of difficulty that each alternative may include when installing, operating, and demobilizing equipment, instruments, etc. It also includes the level of project and technical risk associated with implementation.
 - h. Evaluation for facilitating tank closures

ADDITIONAL INFORMATION – as applicable

CONCLUSIONS

Attachment C: *DRAFT FOR DISCUSSION*
C-104 presentation slides



washington river
protection solutions

Tank 241-C-104 Retrieval Briefing

**D. Kent Smith, Deputy Manager
SST Retrieval and Closure**

June 2011



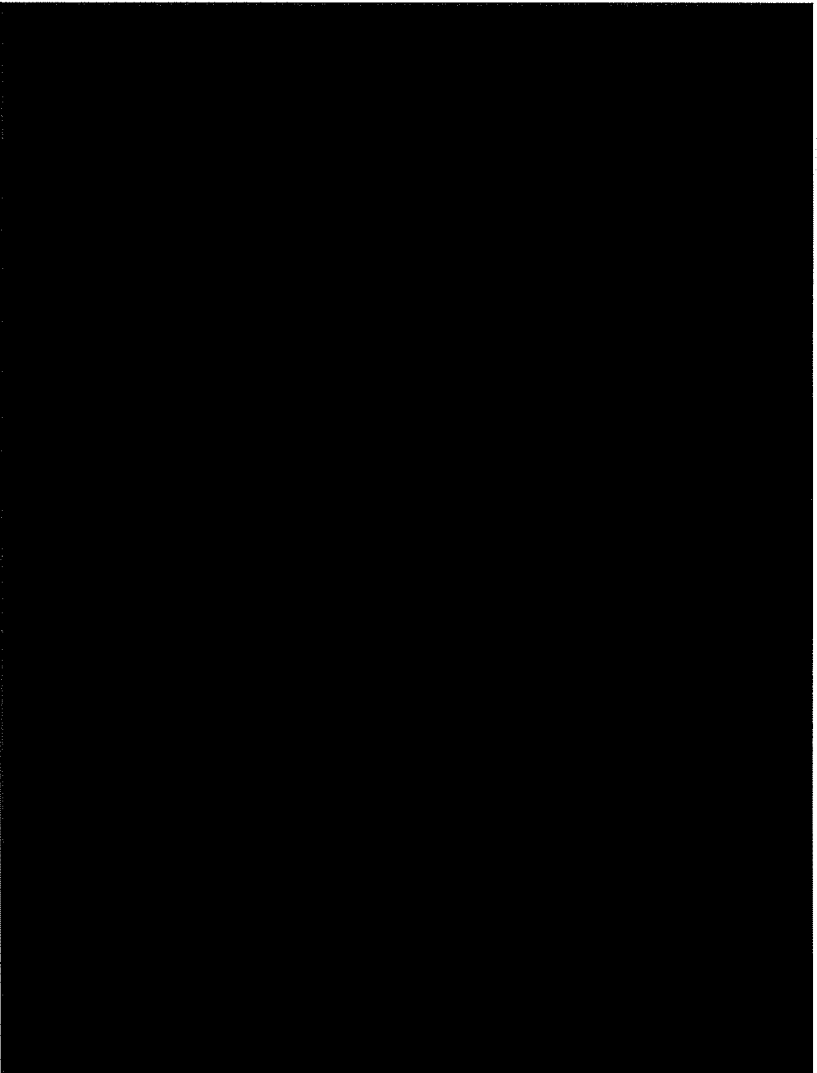
Overview

- Tank 241-C-104 (C-104) bulk waste retrieval has been completed
- Modified Sluicing System has reached Limits of Technology.
- Hot water dissolution at the end of current campaign did not achieve retrieval volume objective
- Recommendations
 - Halt retrieval activities on C-104
 - Sample residual heel in C-104 per DQO/SAP
 - Evaluate potential for additional retrieval method (chemical dissolution) to achieve $<360 \text{ ft}^3$ objective for residuals



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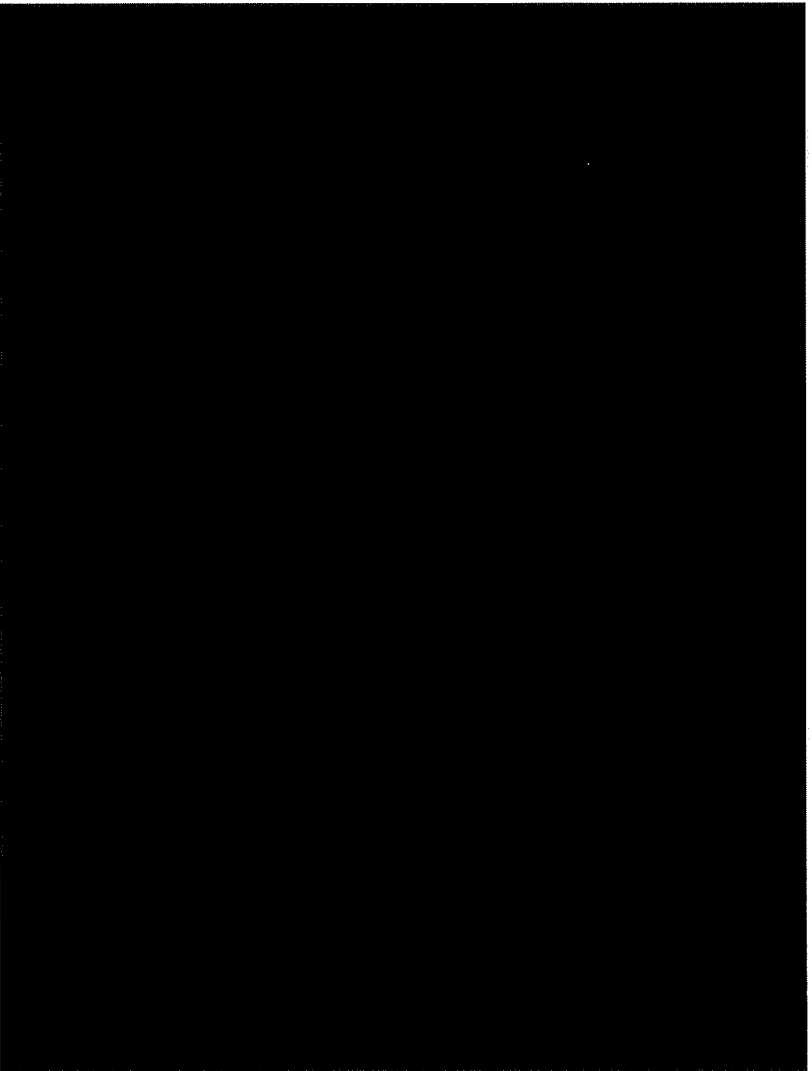
Tank C-104 Pre-Retrieval





Washington State
Department of Ecology
protection and recovery

Tank C-104 Post-Retrieval





Tank C-104 Background/History

- 1943 to 1944 – Construction of C-104
 - 1946 to 1947 – Filled with metal waste from B Plant
 - 1953 to 1955 – Waste removed for uranium recovery
 - 1955 to 1958 – Received cladding waste from PUREX
 - 1969 to 1980 – Numerous tank-to-tank transfers and transfers from PUREX
 - 1980 – Declared inactive
 - 1989 – Interim stabilized in September
 - 2010 – Started retrieval operations on January 8 with about 259,000 gallons of waste
 - 2011 – Modified sluicing completed and remaining solids rinsed with water on May 6
-



Tank C-104 Volume/Inventory

Prior to retrieval

- Volume estimate = 259,000 gallons
- Equivalent waste depth = 103 inches (at center of tank)
 - Dished bottom tank



Retrieval Information

- Approximately 254,000 gallons waste removed
 - 3.96 million gallons supernatant recirculated
 - 46,200 gallons water used
 - 6,000 gallons for construction
 - 25,600 gallons for flushes, rinses, pump seal water, testing, and troubleshooting
 - 14,600 gallons for final hot water dissolution
 - Duration: 66 days (147 shifts) of retrieval operations over a 16 month period
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Retrieval Criteria

- Volume - Retrieve waste until the residual waste is below 360 ft³
- Limits of Technology – Retrieve waste until the limit of technology has been met



Preliminary Volume Estimate

- Waste residual in tank estimated to be 630 ft³ (4,710 gal)
- Volume estimate of residuals on floor based on
 - Volume balance during rinse water pump out and
 - Evaluation of May 2011 video
- Volume estimate of waste residual on walls and stiffener rings and in equipment based on video and conservative assumptions



Preliminary Volume Estimate

- Estimate based on liquid displacement and video evaluation

Waste Location	Waste Volume Estimate (ft ³)	Waste Volume Estimate (gal)
Tank Bottom	568	4,252
Tank Walls	17	124
Stiffener Rings	45	334
Total*	630	4,710

*Sum of volumes may not equal total because of rounding.



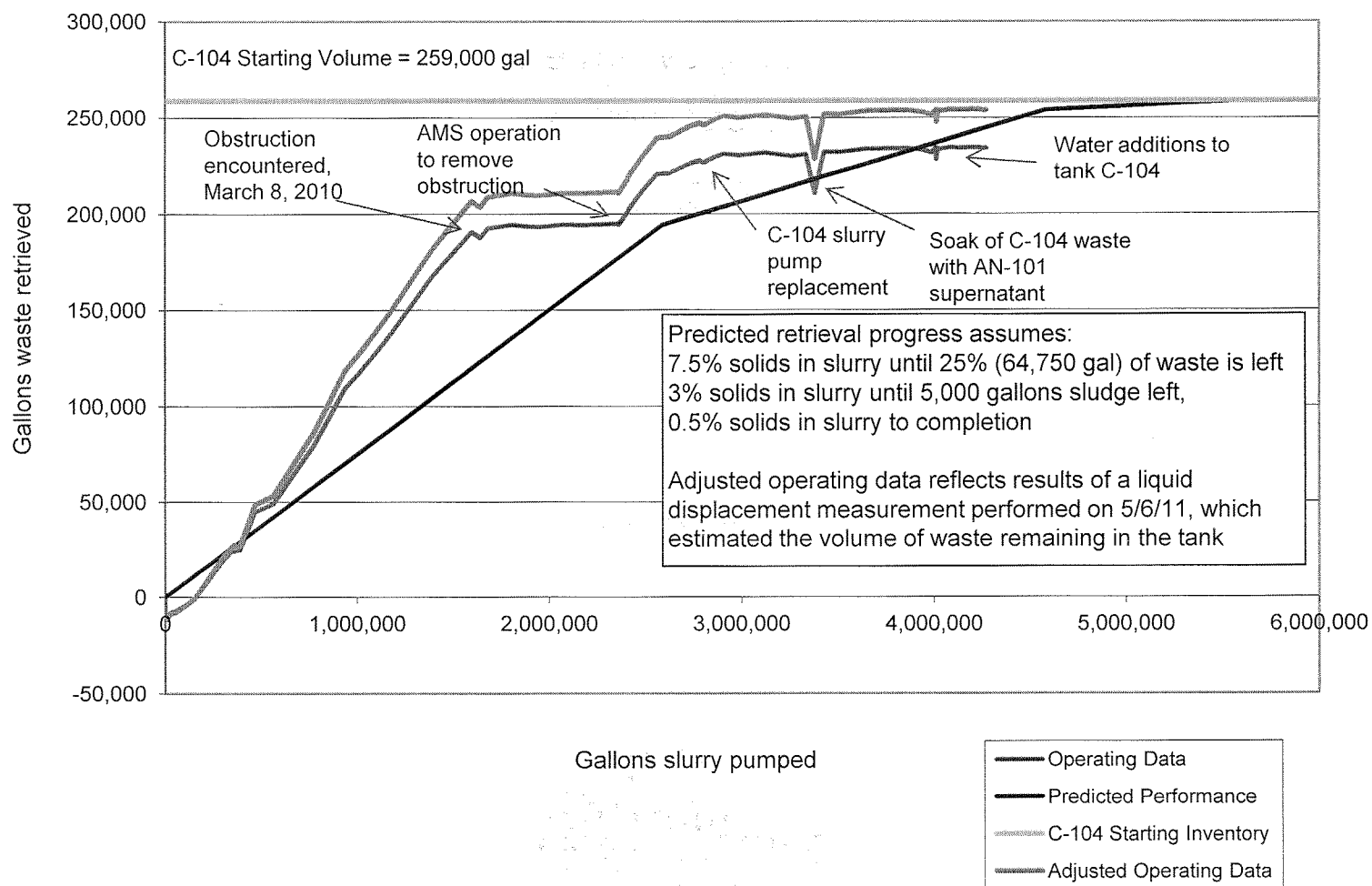
Limits of Technology Criteria Met

- The limits of modified sluicing technology have been met
- The sluicer streams have affected the entire tank bottom
- The sludge is retrieved to the limit of modified sluicing technology based on:
 - Visual observation of system effectiveness
 - Measured recovery of waste per volume of slurry
 - Most of the remaining solids are large and not pumpable



Retrieval Progress

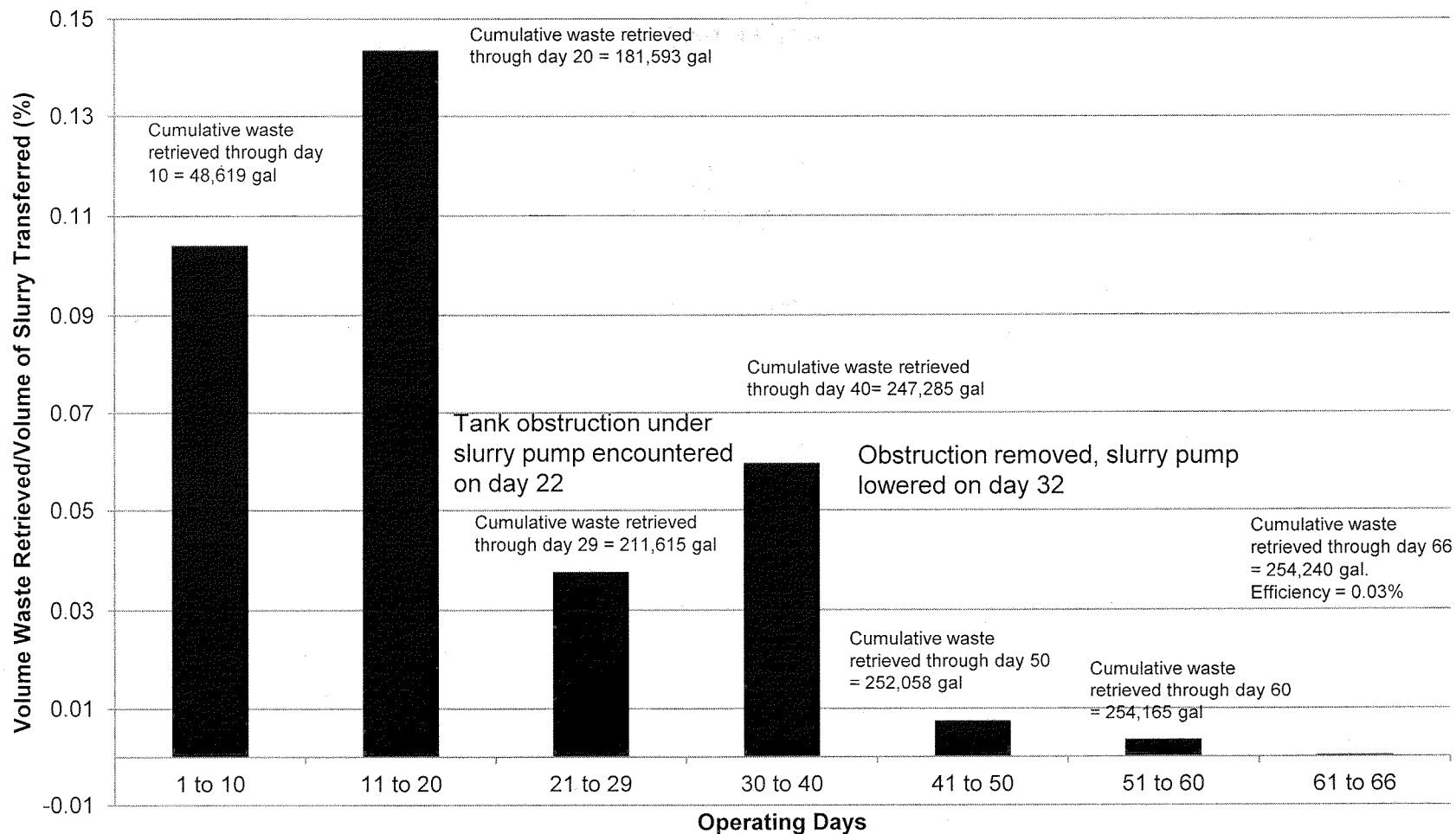
Tank 241 C-104 Waste Retrieval Progress





Waste Retrieval Efficiency

Efficiency, %





C-104 Retrieval Challenges

- Replaced AN-101 Supernate Pump as nitrogen seals began to fail
- Residual heel jet foot valve obstruction directly under slurry pump.
 - Modified and installed Articulating Mast System (AMS)
 - Successful moved foot valve from under pump through a combination of high pressure water and physically pushing with arm.
- Vapors/Odors Experienced during initial startup
 - Increased the exhaust stack height by 23 feet
 - Implemented Vapor Reduction Corridors (VRCs)
 - Increased IH monitoring including real time, alarming area monitors
- Repaired bound slurry pump
- Replaced failed slurry pump



Conclusions

- Tank C-104 bulk retrieval is complete
 - Estimated volume 630 ft³ (4,710 gal)
 - Modified Sluicing Limit of Technology has been reached
 - Next Steps:
 - Evaluate potential Chemical Dissolution using NaOH
 - Sample residuals
 - Lessons learned will be documented and applied to future retrievals
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